# COMBINING CLAY AND LIGHT INTO SCULPTURAL FORMS

PROBLEM IN LIEU OF THESIS

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TABLE OF CONTENTS


| Chapter | | Page |
|---|---|---|
| I. | INTRODUCTION . . . . . | 1 |
| II. | ANALYSIS OF WORK . . . . . | 3 |
| | Form Number One<br>Form Number Two<br>Form Number Three<br>Form Number Four<br>Form Number Five<br>Form Number Six<br>Form Number Seven<br>Form Number Eight<br>Form Number Nine<br>Form Number Ten<br>Form Number Eleven | |
| III. | TECHNICAL PROBLEMS . . . . . | 12 |
| IV. | SUMMARY AND CONCLUSIONS . . . . . | 15 |
| APPENDIX | . . . . . | 16 |
| BIBLIOGRAPHY | . . . . . | 21 |

# CHAPTER I

## INTRODUCTION

This problem concerns the feasibility of combining the elements of light and clay in a sculptural concept of design. The study has determined various procedures of combining the sculptural ceramic forms for the internal inplant of light sources. Specific questions posed were

1. Can the surface decoration be enhanced by external and internal lighting?
2. How does each surface quality, raku, and low-fire salt glaze differ with the interplay of light?
3. In what way may two surface qualities be applied to the same sculptural ceramic forms?
4. How does scale effect each of the pieces?

This problem is a carry-over from my painting experience, dealing with light and form in an illusionistic manner.

After many hours of throwing clay, I was able to develop my style. I feel that the ceramic process of design is an important consideration of the piece.

Having always held my deepest attention, the sphere remains a dominant component in my work. (See Slide Entry 1.) The sphere in this early stage was evolving with the introduction of movement, as the slab-flange sweeps across the

quiet surface. In these early stages of conceptual development, I also executed a lamp form with surface penetrations. (See Slide Entry 2.) These two initial pieces led me to believe that I could merge light into sculptural forms.

The process was carried out in an effort to find new and interesting models, while incorporating both elements of light and clay. I experimented with the placement of the slab-flange forms on the surface. This was to see if they could be enhanced by external and internal lighting. The research also led me to explore the feasibility of combining two glaze surface qualities on the same form.

A personal diary was kept to synthesize my ideas of my sculptural light forms, and my reactions to these pieces. Twenty designs were produced in the study, all of which were visually different. Of these twenty, eleven have been chosen for a closer examination.

## CHAPTER II

## ANALYSIS OF WORK

Through the development of the following ceramic pieces, I was able to deepen my understanding of fundamental design and clay properties. The results gave me better insight into the strength of clay, as well as the invention and construction of thrown forms. The visual unity of using the slab-flange forms and sphere as underlying constants channelled my work into a definite direction of growth in exploring the possibilities in unifying forms. Vital information was drawn from the success of design, as well as from the processes that helped to evolve the end products. Key-points from eleven pieces will be paralled to the questions posed in Chapter I.

### Form Number One

Form Number One exhibits the possibilities in achieving height while serving as a reflective unit for external lighting. The piece was fired to cone six in salt and shows considerable warpage in the slab-flange as well as in the necked column. Structurally, the union between sphere and necked column is too narrow to support the combined weight of sphere and slab-flange, causing a visual lean in the

body. The reason for such a tapered-necked column was to emphasize the sphere and slab flange.

This model is a combination of three forms, the necked column, sphere, and slab-flange. The entire column was air-brushed with a honey slip, leaving the slab-flange partially air-brushed with albany slip. (See Appendix for slip formulas.) Structurally, this piece led me to explore other possibilities in correcting a defective design, as in Form Number Two.

## Form Number Two

Form Number Two was constructed to resolve the complexity of height as well as warpage of the supporting column. These problems were dealt with by making the necked column a degree wider. The thickness of width gives the necked column a stronger support for the bulbous mass. Placement of the slab-flange, on the sphere, draws a particular amount of light interplay. Again this model acts more of a reflective piece, using external light to bounce off the surface.

There is a visual contrast in completed surface tones and qualities. Its finish is a dark-earthy brown, accomplished with air-brushed slips. The earthy brown acts as a neutral tone giving form a stronger dominance. Albany slip was air-brushed on the bulbous form, as the slab-flanges were basically left clean to capture the effects of vapor-glazing. The necked column was air-brushed in a honey slip.

This piece was fired to cone six. The gradation and contrast between colored slips, along with the vapor-glazed exterior yields an impressive harmony. Form Number One and Form Number Two were thrown from clay body number one. (See Appendix.)

## Form Number Three

Form Number Three introduces different aspects of achieving height while incorporating a new approach in designing a sculptural light form. The piece is a union of two separate spheres fitted on each other over a base housing the electrical unit of bulb, socket, and wire. In this particular structure, I used a sixty-watt blue-tinted bulb to amplify color interaction. Visual unity of form is achieved when the slab-flange advances along the surfaces of both spheres. Perforated entrances were placed parallel to the slab-flanges guiding the internal light onto the exterior decoration.

The surfaces of the spheres were air-brushed with a honey slip. The slab-flanges were unadulterated to grasp the effects of vapor-glazing. The base form was air-brushed with an albany slip and tool textured to contrast with the decorous spheres. This particular idea influenced me to seek the possibilities of fitting several spheres in an upward progression.

## Form Number Four

Form Number Four is an extension of concept from Form Number Three in experimenting with the arrangement of fitted spheres. This piece is a combination of three globular bodies inserted on an orbicular base. Unity is maintained as the slab-flange rotates on the external surface of the three spheres. Perforated entrances direct the interior light outward, reflecting off the slab-flanges. The second and third spheres encase the source for emitting light throughout all three forms. The surface lighting is minimal, and is most effective in a dark room. Otherwise, external lighting from overhead sources proves to be the most efficient in interplaying with surface reflections and shadows. Height was achieved successfully, with no warpage as previously evident in the necked column forms. This model is two feet and ten inches in height.

The spheres were fired on separate levels of the salt kiln, giving to the diversity of tonal surfaces. A honey slip, albany slip, and blue-glaze were applied to the surfaces. This model exemplified the safest procedure in attaining height without any technical difficulty with stress or warpage.

## Form Number Five

This piece exhibits the continuous slab-flange movement on the cone base as it is carried over to emphasize the

upright twelve-by-five-inch slab-flange. The cone base houses a bulb with electrical socket to light exterior surface appendages.

As in Forms Three and Four, I penetrated the exterior surface parallel to the slab-flanges for emitting a directed light. The surface was primarily vapor-glazed then fired in the raku-kiln with an application of raku-glaze. The raku-glaze did not adhere to the surface due to body vetrification in the previous vapor-glaze firing at cone six. This finding concluded that it would not be feasible in combining two foreign firing processes on the same model. I was able to achieve subtle tone graduations on the upright slab-flange with the use of controlled air-brush honey slip.

The effectiveness of lighting from the cone base does little to emphasize the external decoration unless in a semi-dark room. The limited amount of perforations gives minimal success in lighting. Reasons for the controlled amount of penetrations will be discussed in the chapter on technical problems.

## Form Number Six

Form Number Six is a simple design development. The model has a base housing an electrical source of light to be guided through the sphere. The upper portion of the sphere was cut into a fitted slab-flange lid making it more accessible in planting the electrical components for lighting. Two

areas of the model's surface were left without any exterior movement of slab-flanges to achieve a circular play of radiating light. This form was thrown from clay body two. (See Appendix.)

The piece is successful in illuminating the exterior appendages and in creating a visual pattern of light in a semi-lighted room. The form was air-brushed with a honey slip, leaving the upper slab-flange to achieve the effects of vapor-glazing. This exclusive development of form gave birth to designing an elevated compartment from the base that will be explored in Form Number Seven.

## Form Number Seven

Form Number Seven exemplifies a change in design by illuminating and emphasizing one upright slab-flange. The housing compartment has been elevated with the introduction of a thrown necked base column. Stature is not critical at this stage, because this model makes a direct statement that can be successfully appreciated visually. The stemmed neck is approximately nine inches to the base of the elevated housing compartment. Total height of the piece is eighteen inches. The upper section has been cut to fit the lidded-slab-flange. This was done in order to make it accessible in placing a bulb and socket within the spherical compartment. Penetrations can be found along the lidded section as well as the funnelled tip used in illuminating the upright

flange. The electrical wire can be inserted at the base traveling through the column and into the sphere.

## Form Number Eight

This form illustrates simplicity in design as a basic reflective unit. The piece is merely a spherical form, with a slab-flange attached to the exterior surface. The surface was treated with air-brushed albany slip, acting as a neutral earthy-brown tone. The slab-flange shows a tonal gradation as three-quarters is left to contrast with a vapor-glaze finish. The flaring flange succeeds in capturing and reflecting direct overhead light. The following forms are branch concepts of a reflective flange that remains dominant.

## Form Number Nine

The spontaneity of the slab-flange is upheld above the cone base in Form Number Nine. This piece has a cone section fitting over a base, conceived for incorporating an interior candle light source. A one-inch opening is found at the top of the cone base, with perpendicular slits. Originally, this piece was to have been self-illuminated. Drawbacks came about when the upper slab-flange would get too hot to touch; the candle lacked sufficient oxygen to maintain a good flame; and the light from the candle was limited to an area too small to be of any significance.

Four constructions of this nature were made with only two succeeding through the drying and firing stages. The

surface contrast can be seen where air-brushed albany slip unite both upper cone and slab-flange. Ninety per cent of the remaining surface is vapor-glazed for a reflective quality of contrast. Key points on stress and design flaws will be detailed in the chapter on technical problems.

## Form Number Ten

Of the smaller reflective sculptural units, Form Ten is balanced with evolved design qualities. The central sphere is situated between the outwardly radiating panels.

The extended panels work well with external lighting. The surface was air-brushed with a blue-glaze outwardly from the sphere to the flange.

## Form Number Eleven

Form Number Eleven was the most successful of a series of similarly designed pieces. The form is a lidded base supporting three tapered flanges, which is secured to a sized base form. A side view of the lidded base shows minimal warpage without crackage which had been prevalent in previous forms. Design flaws will be discussed in the following chapter.

Surface qualities were handled with air-brushed albany and honey slips, as the flanged forms illustrate the effects of vapor-glazing. Penetrations can be seen at the base of the flange forms for the purpose of emitting upward light.

The diversity of sculptural forms gave birth to new concepts relating and extending from each other. Each idea required new input of creative energy in combining thrown and slab-flanges appendages. The emphasized forms that incorporated exaggerated areas of design underwent more structural stress in both the drying and firing stages. The involvement of constructing diverse designs led me to unfold my creative process.

During the succession of undertakings in the clay medium, I was able to gain better insight into the previous experiments. The construction of the majority of pieces was intuitive after completing various sections. Thus, there was little need to rely on preconceived ideas. This approach gave more freedom in expressing my style. As a result of throwing, the pieces were usually tool marked or finished with minimal finger marks. I felt that a smoother surface would enhance the dynamics of the design. Elements of symmetry and balance were always in consideration throughout the process.

The air-brush lent itself to adding subtle tonal surface gradations to connect the form. The technique of air-brush united these distinct thrown sections with greater visual ease. Through the progression of the work, I executed a limited number of the same models to ensure one successful end-product.

## CHAPTER III

## TECHNICAL PROBLEMS

In an effort to combine salt-fired objects with raku-fired surfaces, I experimented with two processes. Both did not yield the desired results. Raku-glaze was applied to the salt-fired surface of Form Number Five with no adhesion. This was due to the vetrification of the clay body which had previously been fired to cone six. In a reversal process,. I proceeded to build a salt-raku kiln, using high fired brick, leaving a side entrance for the introduction of salt, borax, and soda ash. (See Slide Entry 1.) I mixed two pounds test batches, using seventy per cent salt, twenty per cent soda ash, and sixteen per cent borax. The mixture was introduced through a side port. (See Slide Entries 2, 3, and 4.) The pieces were partially dipped in raku-glaze, as a visual gauge for introducing the salt-mixture. The firing process did produce a smoke cloud familiar with the introduction of salt for a period of eight to ten minutes. (See Slide Entry 5.) Three consecutive batches were introduced to each firing. As the firing proceeded, no visual findings yielded a glossy-glass surface familiar with salt-fired pieces. (See Slide Entries 6 and 7.) The raku-glaze matured but with no visible indication of a salted surface. This process of raku-salt

is still in a very experimental stage with virtually little or no available information concerning procedures. After five raku-salt firings I concluded that such a process would not be feasible in combining both of these surfaces. The surface qualities of the remaining pieces were left partially glazed with contrasting non-glazed surfaces.

The reason for choosing the slab-flange form as a vital surface decoration was for its receptivity for capturing directed external or internal lighting. The width and length varied with each individual design. The slab-flange form also allowed me to express movement, adding to content of shape and design as an aesthetic accent on the piece. Structurally, these models had drawbacks during the drying and firing stages. There was minimal warpage of the flanges, due to off-center gravity point as the temperature rose. Another drawback of these flange forms was the amount of space that they occupied spatially in the stacking of the salt kiln. This eliminated the possible solution of tighter placement of pieces in the salt kiln.

The structural problems as found in Form Number Eleven stemmed from too many penetrations around the base lids. The penetrations weakened the surrounding base area of the slab-flanges. Stress was apparent in the drying and firing stages, as is evident in Slide Entry 8. Many pieces had to be carefully and slowly dried in order to prevent any breakage. A series of designs were constructed from Form Number

Nine. The limited amount of actual clay contact between slab and cone contributed to breakage. This was another reason why the drying process had to be considerably controlled with plastic covers over the pieces and by avoiding room drafts.

The taller sculptural forms were introduced to the kiln as greenware. Flint and wadded clay balls coated in kiln wash consisting of kaolin and alumina hydrate, in equal parts, was used to prevent friction.

# CHAPTER IV

## SUMMARY AND CONCLUSIONS

The development of the sculptural forms gave me a personal insight to the clay's characteristics and limitations. I established that structural demands varied from form to form. The reflective qualities of the slab-flange did enhance the sculptural forms. With information at hand, I concluded the experimental firings would not be feasible to combine two types of glaze surfaces. I concluded that scale was significant in respect to the internally lit pieces. Ample space had to be allowed for electrical lighting components. The reflective pieces worked well with no restrictions to scale.

The study led me to analyze clay designs in terms of stress areas, as well as incorporating light with clay. In determining areas of stress, I was able to determine and evolve my designs away from previous weaknesses. This stage was extremely important for the drying and firing stages. I also gained an understanding of assembling individual forms into sculptural units. The firing experiment of combining two glazes on the same surface yielded to future possibilities of growth. I was able to develop my own clay bodies which met my expectations. The air-brush glaze application

gave me a better understanding of achieving tonal gradations. The acquired knowledge, through the study, will help me to synthesize future directions.

## APPENDIX

### THE CLAY AND SLIPS

I developed two high-fire bodies which reacted successfully with both salt and raku firing. They were all whiteware bodies and plastic enough for throwing tall forms as well as spheres. The clay met my personal needs in throwing and firing. They are as follows:

Clay Body One

| | |
|---|---|
| A. P. Green Fire Clay | 35 lbs. |
| Kaiser Fire Clay | 15 lbs. |
| Ball Clay | 15 lbs. |
| Nephline Synite | 10 lbs. |
| Talc | 2 lbs. |
| Soda Ash | 3 lbs. |
| Feldspar | 20 lbs. |
| | 100 lbs. |

This clay body yielded low shrinkage in firing with no serious crackage in the drying period. When fired in salt, the body was white with little iron content.

Clay Body Two

| | |
|---|---|
| A. P. Green Fire Clay | 20 lbs. |
| Kaiser Fire Clay | 25 lbs. |
| Ball Clay | 16 lbs. |

| | |
|---|---|
| Nephline Synite | 25 lbs. |
| Flint | 10 lbs. |
| Feldspar | 5 lbs. |
| | 100 lbs. |

This body when fired in salt gave an extremely white body color. The body was fired to cone six. As for the throwing qualities the body met my needs.

## Slips

The following formulas were used for slips that periodically were air-brushed on the forms.

### Albany Slip

| | |
|---|---|
| Albany | 75 |
| Nephline Synite | 25 |
| Rutile | 1 |
| Iron Oxide | 2 |

### Honey Slip

| | |
|---|---|
| Albany | 81 |
| Lithium Carbonate | 10.5 |
| Rutile | 7.0 |
| P. Illmanite | 5.0 |
| Gristly Borate | 5.0 |

### Blue Salt Slip

| | |
|---|---|
| Albany | 81 |
| Lithium Carbonate | 10.5 |
| Cobalt | 2.5 |
| Gristly Borate | 5.0 |

All the oxides in heavy applications yield a dark brown metalic surface. Cobalt achieved tones of blue. Again the white ware body sets off the blue salt slip successfully.

The slips were generally applied with air-brush. The slips were of the consistency of milk to make them soluable enough for air-brush passage. Several coats had to be applied to achieve the proper thickness. This controlled process of application eliminated any serious glaze running off the form.

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